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Abstract

PROSPECTING AND MINING OF NUCLEAR RAW MATERIALS IN PORTUGAL

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A uraniferous deposit was first discovered in metropolitan Portugal in 1909. This was followed by intensive prospecting and mining, having exclusively in view the production of radium, subject to the varying conditions of production costs, supply and demand.

From 1910 to 1944 a total of ca. 25,000 tons of high grade ore (0.50 % to 1.00 % of U_3O_8) were mined. The production of radium from this ore amounted to about 50 grams.

Mining for the production of uranium started with the advent of the atomic era. 1325 tons of U_3O_8 were produced from 1950 to 1962.

A program of systematic radiometric prospecting was started in 1955 covering a favourable geological facies, namely all hercynic granitic massifs, all adjacent pre-ordovician schist complexes, and the continental formations belonging to the Autunian and the Miocene-Pliocene.

Numerous occurrences and uraniferous deposits of various metallogenic types were identified. Predominant among these were veined ore deposits with more or less complex gangues - these being until then the only deposits which were known and had been exploited - and bearing surface impregnations of secondary metals on the metamorphic aureoles of some granitic massifs. These deposits showed favourable prospects.

This was followed, starting in 1959, by the systematic exploration of the more important deposits by means of borings and underground work. This is expected to continue through 1965.

It will not be possible to determine the uranium reserves with a certain degree of precision before the conclusion of this work. On the basis of present knowledge a preliminary estimate of reserves in metropolitan Portugal may be placed at 6,000 tons of U_3O_8, in ores of an average grade of 0.20 %.

Air-borne radiometric and magnetic surveying was carried out in Mozambique during 1961 and 1962, covering four areas selected according to their geological and structural characteristics. These comprises Basement Series, igneous rocks, Karoo System and carbonatites, totalling 24,000 sq. km.

A great number of anomalies, having in general small amplitudes, has been recorded, which may be attributable to complex uranium and thorium ores, the latter being the predominant mineral. The systematic study of these anomalies will be initiated soon.

The well-known Tete deposits, located in the vicinity of one of those areas, contain refractory mineralisation (davidite and samarskite) found in 1947. Total production from 1949 through 1957 amounted to 388 tons. Determination of reserves is at present being worked on.

The pegmatitic areas in the Zambézia district have been surveyed in 1963, with a view to coordinating all geological, metallogenic and economic data concerning the important deposits that have been discovered since 1940. Its mineralisation is rich and diversified. Beryl and columbite - tantalites are the predominant minerals. Production from 1956 through 1963 amounted to 7,822 and 985 tons, respectively. Estimates of the order of magnitude of the reserves are being prepared.